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Inspection of Government buildings.—Under Executive order, all Government buildings in the District of Columbia, with the exception of those of the War and Navy Departments, are regularly inspected for sanitary defects, reports of such inspections being forwarded to the departments concerned. Cognizance is taken of overcrowding, heating and cooling, ventilation, lighting, and other conditions bearing on the health of workers, the reports stating in detail the sections concerned and offering definite recommendations as to the best methods for the correction of the evils found existing. Similar inspections have also been conducted of many of the lighthouses and other Government buildings throughout the country.

HEALTH OF GARMENT WORKERS.

THE RELATION OF ECONOMIC STATUS TO HEALTH.

Introduction.

By J. W. SCHERESCHEWSKY, Surgeon, United States Public Health Service.

During the summer of 1914 the condition of the health of garment workers in the women's garment trades in New York City was investigated by the Public Health Service at the solicitation of the joint board of sanitary control of these trades. Part of the investigation consisted of careful physical examination of some 3,000 garment workers, 2,000 males and 1,000 females. This examination involved the collection of a large mass of data consisting not only of bodily measurements and facts as to the physical status, but also of other data of a social or economic character. In the report of this investigation, published as Public Health Bulletin No. 71, the data collected were tabulated with a view to bringing out the chief points of interest relative to the state of health of such workers. Because, however, of the self-evident relation between the economic status of the worker and his condition of health, these data might furnish interesting facts if tabulated from this standpoint.

In the following paper by Surg. B. S. Warren and Public Health Statistician Edgar Sydenstricker, the data collected in this investigation have been submitted to such an analysis, with convincing results. As remarked by these writers, while it is well understood that poverty and ill health go hand in hand, data showing this objectively are rare in the literature. The publication of additional data of this character must, therefore, always be regarded as a distinct contribution to the foundations for improving the physical welfare of man.

Health of Garment Workers in Relation to Their Economic Status.

By B. S. WARREN, Surgeon, and EDGAR SYDENSTRICKER, Public Health Statistician, United States Public Health Service.

The conclusion suggested by the vocational study of the health of garment workers in the cloak, suit, and skirt industry in New York City, which was conducted by the United States Public Health Service, was that "no vocational diseases peculiar to garment workers" existed, although the effect of sedentary occupations, such as the women's garment industries, was to intensify the bad effects of certain defects or diseases or to produce them in predisposed individuals and in this way impair the health and efficiency of the workers. It was suggested that low wages and irregularity of employment were important factors in causing certain conditions of ill health, as, for example, tuberculosis and neurasthenia.[1]

Although the investigations and observations of those familiar with conditions among low-paid wage earners go to show that economic conditions have marked effects upon the health of wage-earners and their families, there is a general lack of statistical data indicating these effects. The suggestion referred to above was so directly in line with such statistics and observations as are available that the data secured in the course of the vocational study were examined and tabulated on the basis of differences in the economic status of the garment workers as indicated by their annual earnings, in order to exhibit whatever relation might exist between their earnings and their physical condition. Such a use of the data on physical status was possible because data were obtained at the same time on average weekly earnings and average annual earnings of each worker. Furthermore, data were also secured at the time of the physical examinations showing the number of children, both living and dead, of each married male worker, thus affording indications of the size of the families of this group of workers as well as permitting computations of child mortality in these families. Since the great irregularity of employment in the garment industry has been found to be an important factor in determining the economic status of the workers, a consideration of the relation between their weekly and annual earnings in connection with the data on physical status was also believed to be pertinent. As indicators of the general physical status of the workers, the data bearing on the state of their nutrition, the hemoglobin percentages, and incidence of tuberculosis were selected for purposes of comparative tabulations. Only male married garment workers were included in these tabulations.

In the following pages are briefly presented (1) A classification of male married garment workers according to annual earnings on the basis of the adequacy of annual earnings to afford incomes sufficient for the maintenance of families under healthful living conditions; (2) Certain data on the child mortality in the families of these workers and on the physical status of the workers themselves according to income groups; and (3) Data indicating the degree of the regularity of their employment according to income groups.

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[1] Public Health Bulletin No. 71, United States Public Health Service: Studies in Vocational Diseases. I. The Health of Garment Workers, by J. W. Schereschewsky, Surgeon, United States Public Health Service, pp. 94, 97, 98, and 100.

CLASSIFICATION OF WORKERS ACCORDING TO INCOME.

In making a classification of the male married garment workers according to their annual earnings, two considerations were deemed to be of especial importance. First, that the differences between the earnings of the lowest and highest groups should be sufficient to exhibit marked difference in economic status, at the same time including in each group a sufficient number of heads of families to represent conditions typical of each group. Second, that each worker should be a member of a family and that his annual earnings should be regarded, as far as possible, as an indicator of the economic status of his family. With these considerations in mind, the following classification was made:

Families whose heads annually earned—	Number for whom data were secured.	Average annual earnings.
Less than $500	381	$382
$500 to $699	581	577
$700 and over	462	866

That the annual earnings of family heads thus classified indicate the economic status of their families is an assumption strengthened by several considerations arising from the character of the families included in the data. First, the possible additions from earnings of children to family income appear to be small in any of the three groups. The majority of family heads were under 35 years of age, the average age in the lowest income group being 37, in the middle group 35, and in the highest group 32. The possibility of having children old enough to increase materially the family income is thus apparently slight. Second, it would appear that the profit from boarders and lodgers was almost negligible. Only one family in three in the lowest income group and one out of every two in the two higher groups had any other person in the household than parents or children.[1] Third, the tendency in Hebrew garment workers' families to rely upon the earnings of wives is very small, as investigations of garment workers' families have shown.[2]

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[1] This is corroborated by the data obtained by the Federal Immigration Commission for Hebrew garment workers. Less than 15 per cent of the Hebrew garment workers' families investigated by the commission were found to have any income from payments of lodgers or boarders, which was a lower percentage than that found in any of the other racial groups in the industry. (Reports of the U. S. Immigration Commission, vol. 11, p. 311.)

[2] The investigations of the Immigration Commission into families of garment workers showed that only about 4 per cent of Hebrew families had an income from the wives, and that the proportion of total family income from the earnings of wives was less than 1 per cent, a proportion lower than that found in families of any other race. (Ibid, pp. 311, 313.) The same condition was found by the Federal Bureau of Labor in its investigation of men's clothing workers in New York City. Although families where wives were employed were sought by the Bureau of Labor for purposes of its study, less than 10 per cent of the wives in Hebrew families were found to contribute to family income, either by working in factories and shops or by doing contract work at home. This proportion was much less than that prevailing in families of other races. (Report on Condition of Woman and Child Wage Earners, vol. II, p. 358.)

The earnings of the family head may therefore be said to indicate with a fair degree of exactness the general economic status of the family. The lower limit of $700 for the highest income group was determined upon after considering the average income of the group ($866) and making allowance for possible additions to the family income from other sources. The basis for the consideration was the estimate that it required $800 to $900 annual income for the average family of five persons to maintain a healthful standard of living in New York City. Intensive budgetary investigations of wage-earners' families in New York City have afforded bases for several determinations and estimates of a minimum "adequate" family income in which a fundamental consideration was the minimum annual amount necessary to maintain a wageworker's family of five persons (man, wife, and three dependent children under 14 years of age) under healthful conditions of living. These determinations and estimates agree that an annual family income of between $800 and $900 is the minimum amount necessary for this purpose in New York City.[1] It would thus

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[1] See R. C. Chapin: Standard of Living in New York City: Mrs. L. B. More: Wage-Earners' Budgets; New York Factory Investigating Commission: Fourth Annual Report, Vol. IV, Appendix VII, The Cost of Living in New York State; New York City Bureau of Standards: Report on the Cost of Living for an Unskilled Laborer's Family in New York City, submitted to the Committee on Salaries and Grades of the Board of Estimate and Apportionment. Prof. Chapin's and Mrs. More's determinations were the results of investigations of several hundred wage-earners' families in New York City in 1907. The New York Factory Investigating Commission's determination of a minimum family income was made under the direction of Prof. F. H. Streightoff, and was largely based on Prof. Chapin's data and further data obtained by original investigations of wage-earners' families in 1914. The data used in the above determinations, together with some additional data, formed the basis for the New York City Bureau of Standard's determination in 1915.

These estimates are summarized in the following table:

Estimates of minimum annual income adequate for wage earners' families in New York City.

Items of expenditure.	Chapin, 1907.	More, 1907.	Factory commission, 1914.	Bureau of standards, 1915.
Food	$359	$364	[a] $325	$380
Rent	168	168	200	168
Fuel and light	48	40	20	42
Clothing	114	100	140	104
Car fare	16	([b])	31	30
Insurance	17	35	36	23
Health	22	([b])	22	20
Sundries	74	143	103	73
Total	813	850	876	840

[a] The cost of food for a family of 5 persons (man, wife, and 3 children under 14 years) appears to be low when compared with the estimates of Prof. Chapin and Mrs. More seven years before, when retail food prices were much lower than in 1914, and when compared with other costs of food at New York prices. The New York Factory Investigating Commission's estimate of a per capita food cost per day for adult males is 27 cents. (See Fourth Annual Report, Vol. IV, p. 1640.) This is the same as the daily cost of ration for an adult male in the United States Army at wholesale prices in 1914. The average cost of a well-balanced daily ration at the New York Marine Hospital for all inmates, including employees, was 35 cents per day in 1914. This ration is calculated to furnish 3,000 to 3,500 calories per day, an amount which is considered sufficient for a man at ordinary labor. On this basis, the annual cost for a family, as defined above (3.3 male units) would be $420. The marine hospital ration was purchased from retail merchants under annual contract.

[b] Included in "Sundries."

appear that the group of male garment workers earning $700 or more a year may be said conservatively to include those families which have an adequate annual income for the maintenance of healthful conditions of living. Even if the middle group should contain some families with adequate incomes, there can be little doubt that the families in the lowest group, whose heads earn less than $500—averaging only $382 a year—do not have adequate incomes. An additional fact to be considered is that the families in the lowest income group had a larger number of children per family than those in the two higher groups. This would tend to make the per capita income relatively smaller than that indicated by the statistics presented. The number of children per family in the three income groups is shown in the following table:

Annual earnings of family heads.	Average total number of persons per family.	Average number of children per family.
Under $500	5.36	2.99
$500-$699	5.33	2.78
$700 and over	4.88	2.43

HEALTH OF GARMENT WORKERS ACCORDING TO INCOME.

Using the foregoing classification according to income—the highest income group including those with what might be considered an adequate family income and the lowest groups including those with income plainly inadequate for maintaining healthful conditions of living—the data relative to child mortality and physical status of the heads of the families are briefly summarized in the following paragraphs:

Child mortality.—The mortality rate of children in the lowest and highest income groups showed the following variations:

Annual earnings of heads of families.	Total number of children.	Average number children born per family.	Average number children living per family.	Average number children dead per family.	Per cent of mortality among children.
Under $500	1,434	3.78	2.99	0.78	20.69
$500-$699	1,961	3.34	2.78	.56	16.72
$700 and over	1,270	2.75	2.43	.32	11.65

As these statistics show, the per cent of mortality of children in the group where heads of families earned less than $500 a year was 82 per cent greater than, or nearly twice as high as, the per cent of mortality of children in the group where the family heads earned $700 or more a year. These data indicate the same general variations in child mortality among families of different incomes as those shown by some other recent investigations.[1]

Nutrition of garment workers.—The percentage of male married garment workers in a state of poor nutrition showed wide variations in the three income groups. Approximately twice as great a proportion were poorly nourished in the group earning less than $500 a year as in the group earning $700 or more a year, as shown in the following tabulation:

Annual earnings of family heads.	Total number.	Per cent classed as "poor" in nutrition.[1]
Under $500	372	25.00
$500-$699	566	15.02
$700 and over	456	12.72

[1] While the personal equation of the examiner is undoubtedly a factor in the classification of an individual as to his state of development and nutrition, nevertheless, such observations are of value. (Schereschewsky: sup. cit. p. 37.)

Anemia.—Determinations of the percentage of hemoglobin of each garment worker showed marked differences among the individuals in the three income groups. Those showing hemoglobin percentages below 80 were classed as anemic, the Talquist scale being used in making the determinations. The proportion of individuals having hemoglobin percentages under 80 was over twice as high in the group earning less than $500 a year as in the group earning $700 or more a year. It is interesting to note that not only was the proportion of anemic individuals greatest in the lowest income group, but the average hemoglobin percentage was lowest in that group. The results of the tabulations on the basis of income are presented below:

Annual earnings of family heads.	Total number.	Average hemoglobin index—Talquist.	Per cent with hemoglobin index under 80.
Under $500	372	85.94	9.94
$500-$699	566	86.99	5.65
$700 and over	456	87.35	4.42

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[1] An investigation of infant mortality by the Federal Children's Bureau in Johnstown, Pa., showed that in families where the father earned less than $521 a year, or less than $10 a week, the infant mortality rate was 255.7 as contrasted with 134.7 for the community as a whole, and 101.4 in families where the father earned $900 or more a year. (Infant Mortality—Results of a Field Study in Johnstown, Pa., p. 45.) In a similar investigation in Montclair, N. J., the children's bureau found that the infant mortality rate in families where the income was less than $12 a week was more than twice as high as in families where the income was $23 or more a week. Both of these investigations were of births (excluding stillborn) among families of all incomes in the localities during a year. A study of infant mortality in Fall River, Mass., in 1913 showed that a much higher rate was prevalent among families of low-paid textile workers than in other families (L. I. Dublin: Infant Mortality in Fall River, Mass. American Statistical Association Publications, XIV: 505-520). A study of mortality in Birmingham, England, by Robertson, showed that in families where the father earned less than a pound a week the infant mortality was 196 in 1910 and 211 in 1909 as contrasted with 127 in 1910 and 146 in 1909 in families where the father earned a pound or more a week. (John Robertson, M. D. D.: Infant Mortality in Relation to Factory Labor, Transactions of the Fifteenth International Congress on Hygiene and Demography, Washington, 1912, Vol. III, Part II, p. 950.)

Prevalence of tuberculosis.—The proportion of tuberculous individuals among the garment workers who were heads of families showed extremely wide variations when the highest and lowest income groups were compared. The following tabulation exhibits this comparison:

Annual earnings of family heads.	Total number.	Per cent of family heads tuberculous.
Under $500	372	5.64
$500—$699	566	5.30
$700 and over	456	.44

The significance of this wide difference is further seen when the tuberculosis rate in the lowest income group is compared with the average rate found among large numbers of wage earners, without regard to income. The rate for all male garment workers, including the single as well as the married, who were examined, was 3.11.[1] The examination of about 20,000 workers in varied industries in Cincinnati by Robinson showed a tuberculosis rate of 1.1 per cent.[2] The rate of 5.64 per cent in the lowest income group is much higher than the rate found in several other physical examinations of large numbers of wage earners.[3]

IRREGULARITY OF EMPLOYMENT.

No discussion of the relation of economic conditions to the wage-worker's health in the garment industry should leave out of consideration the great irregularity of employment.

As a recent investigation of the regularity of employment in this industry has shown,[4] the year is made up of two busy seasons and two dull seasons, each lasting from 12 to 14 weeks. Thus for about one-half of the year there is a serious lack of employment for the workers in the industry. The economic significance to the worker of this seasonal irregularity is seen in the facts that nearly one-half of the workers are without opportunity for employment in the industry in the dullest seasons, and that less than 18 per cent of them are regularly employed throughout the year. It is evident, therefore, that the competition among workers in this industry is great and that a process of selection of those who work more regularly than others is continually in progress. How far efficiency, as measured by physical condition of the worker, plays a part can not, of course, be definitely stated. Nor can it be determined with any degree of exactness whether inefficiency is more of a cause than an effect of the unemployment of any individual worker. The fact, however, is not without significance that the workers in the lowest income group were at the same time in poorer physical condition and were less regularly employed than the workers in the higher income groups.

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[1] Schereschewsky: sup. cit. p. 94.

[2] U. S. Public Health Service Bulletin, No. 73, p. 58.

[3] Examinations by Dr. George M. Price, director of the New York State Factory Investigating Commission, showed the following tuberculosis rates: 800 bakers, 2.4 per cent; 800 tailors, 1.6 per cent; 600 tobacco workers, 1.3 per cent. (George M. Price, M. D.: Occupational Diseases and the Physical Examination of Workers, Transactions of the Fifteenth International Congress on Hygiene and Demography, Washington, 1912, Vol. III, Pt. II, p. 847.) Examinations of over 7,000 employees of the Sears, Roebuck Co., in Chicago, by Dr. H. E. Mock, during a period of five years, showed a tuberculosis rate of 4 per cent. (H. E. Mock, M. D.: An Efficient System of Medical Examination of Employes, Transactions of the Tenth Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, Washington, D. C., 1914, p. 44.) All of the rates quoted above are without regard to income of the workers.

[4] U. S. Bureau of Labor Statistics: Bulletin 147, Wages and Regularity of Employment in the Cloak, Suit, and Skirt Industry. See pages 7-68 for data relating to the industry in New York City.

The regularity of employment of the workers in each of the three income groups is suggested by comparing their full-time weekly earnings when at work with their actual annual earnings.[1] This comparison is shown in the following table:

Annual earnings of family heads.	Average rate of weekly earnings.	Average actual annual earnings.	Per cent of maximum possible annual earnings actually received.
Under $500	$19	$381	38
$500 to $699	23	577	48
$700 and over	27	866	61

It is thus seen that the average worker in the lowest income group received only 38 per cent of what he could have earned had he been able to secure employment for every week in the year at his usual full-time weekly wage. This is in sharp contrast to the 61 per cent received by the average worker in the highest income group.

The situation is clearly suggested, therefore, that the greatest number of poorly nourished, anemic, tuberculous workers in an extremely seasonal industry were in that group composed of the lowest paid and the least regularly employed.

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[1] If the rate of weekly earnings is multiplied by 52, the maximum possible annual earnings is obtained for comparison. Thus in the group of those actually earning less than $500, the average weekly income multiplied by 52 would make $988; in the group of those actually earning between $500 and $699 it would make $1,196, and in the group actually earning $700 or more, it would make $1,404.